



# **Armed Forces College of Medicine AFCM**



# **Upper Airway Nose, Pharynx, Larynx & Trachea**

# INTENDED LEARNING OBJECTIVES (ILO)



**By the end of this section each of the student should be able to:**

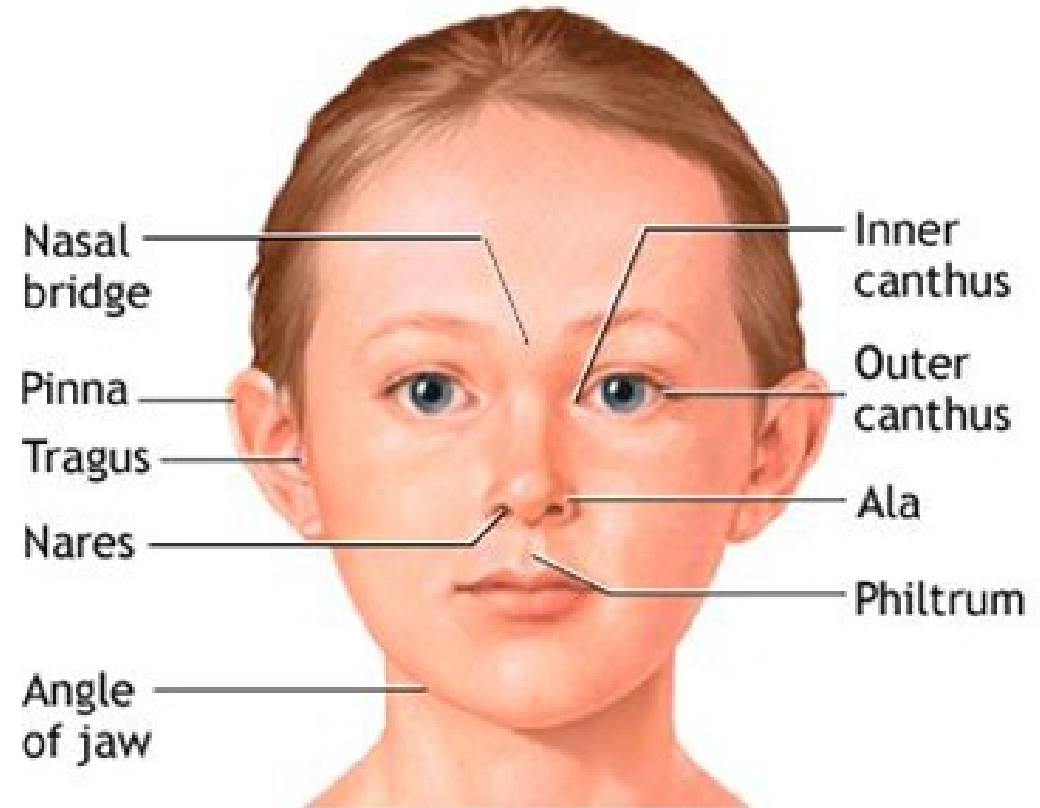
1. Demonstrate roof, floor medial and lateral wall of the nose
2. Identify the anatomical features of nasopharynx
3. Identify the cartilages and ligaments of the larynx.
4. Recognize the boundaries of laryngeal inlet
5. Identify the features of the laryngeal mucous membrane.
6. Recognize the difference between the true and false vocal cords

# The Nose



## External Nose

-It has a **bridge**, **tip**, **nares** (*nostril = anterior opening of nose*) and **ala** of nose which bounds the nostril laterally.

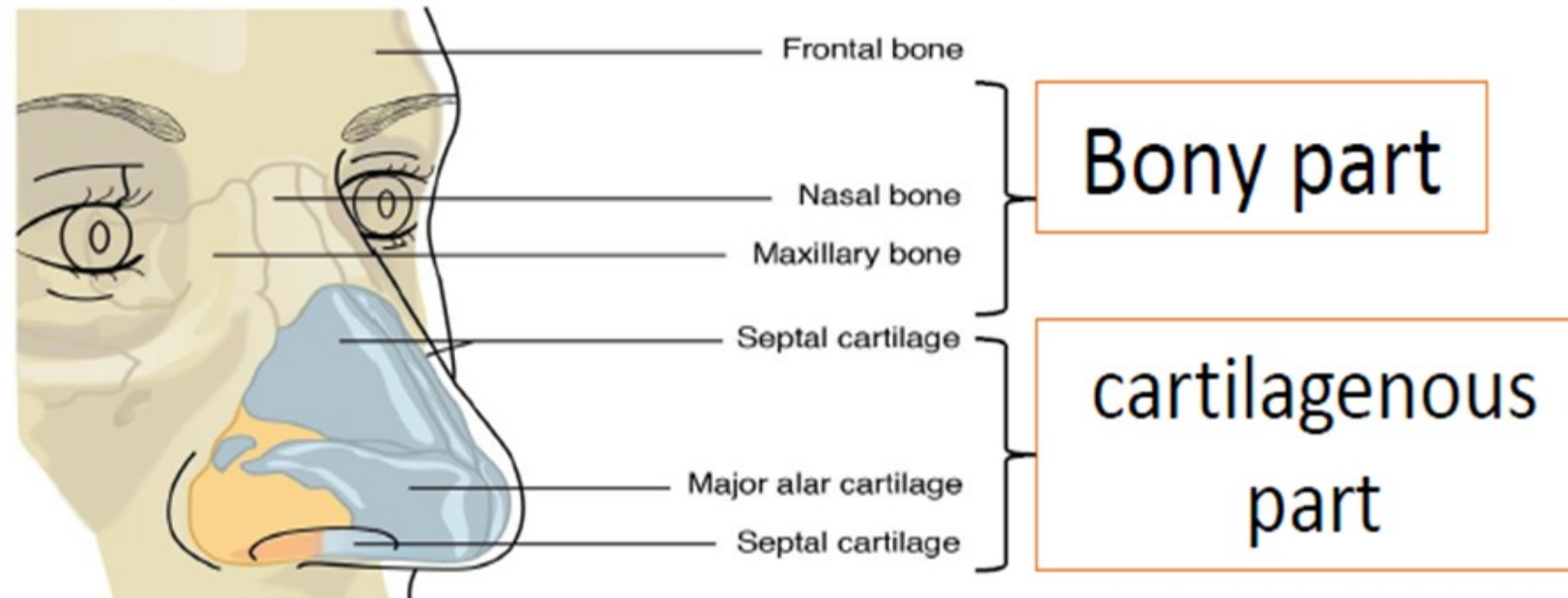
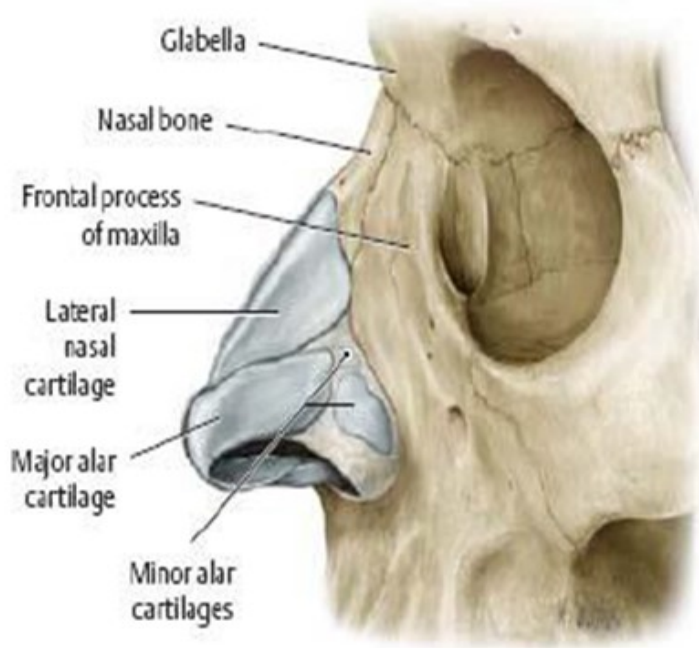


ADAM.

# The External Nose



- Its skeletal framework is formed by:  
The ***nasal bones + frontal processes of maxilla & the nasal cartilages.***

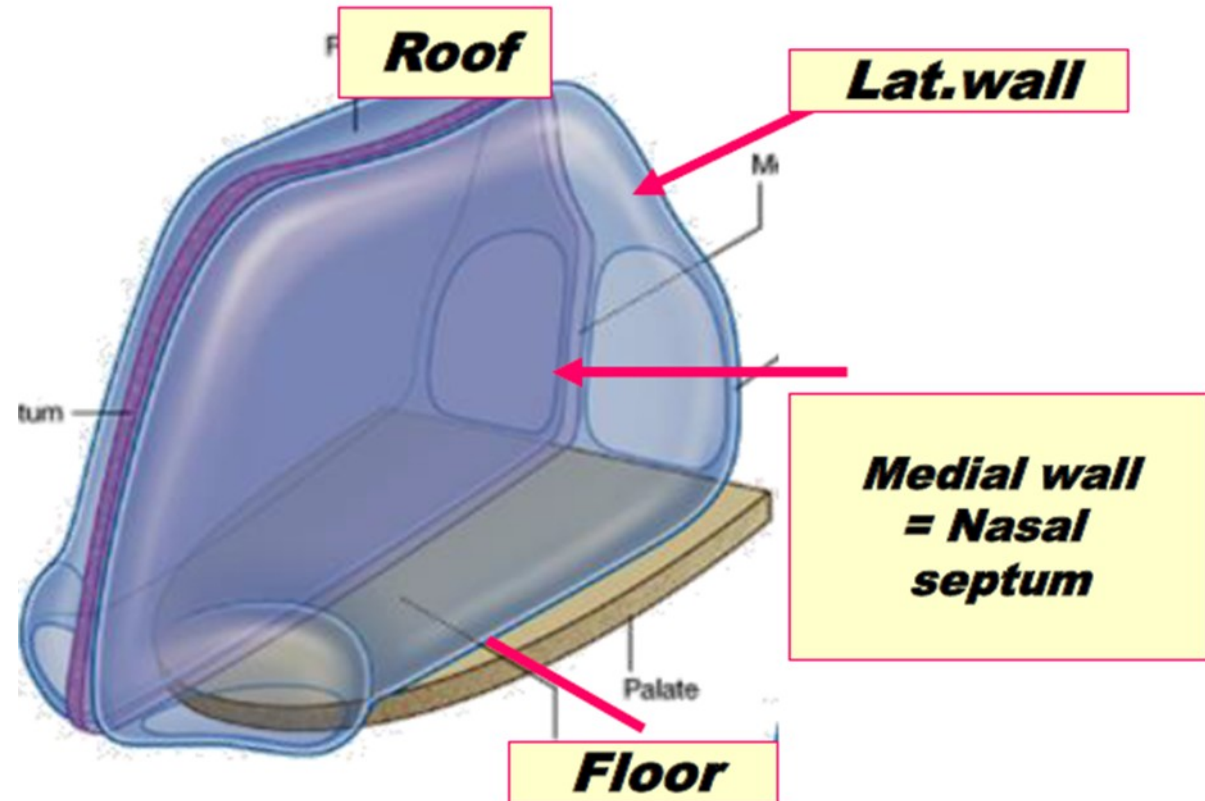


# The Nasal cavity



Each nasal cavity has a

- Floor
- Roof
- medial wall
- lateral wall



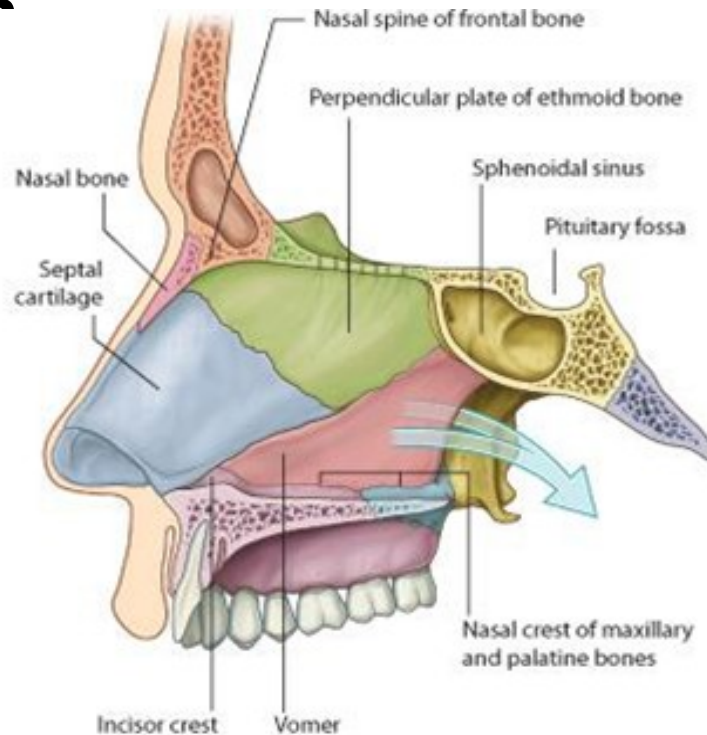
10



# The Nasal cavity

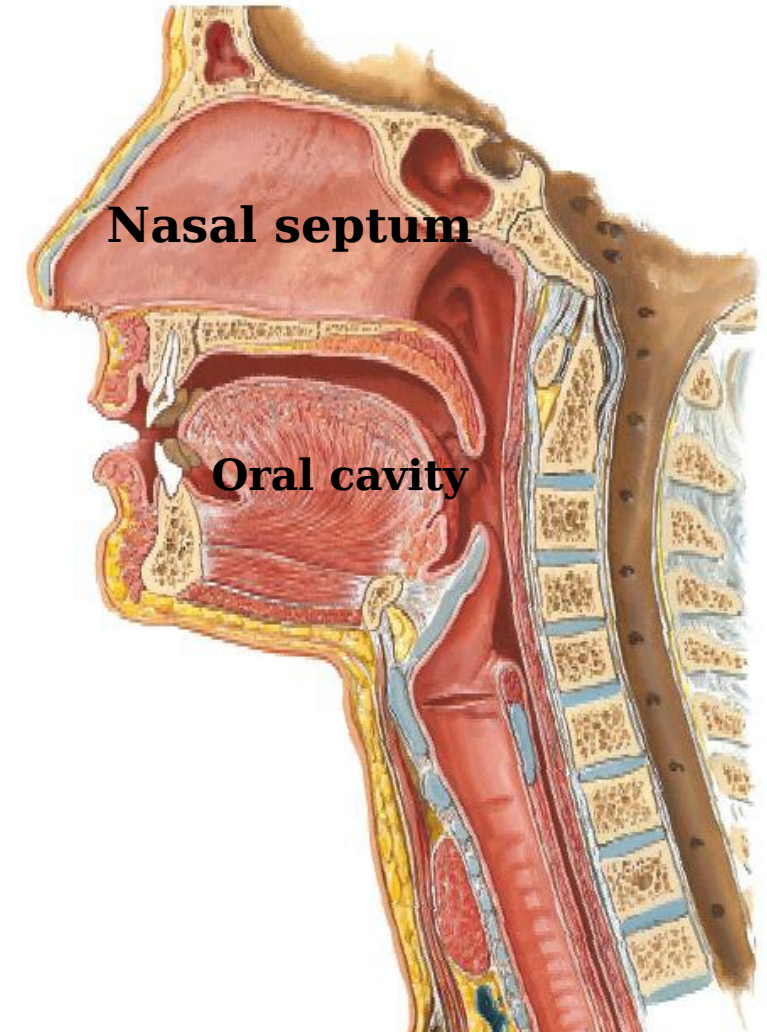


## Medial Wall It Is Called Nasal Septum



© Elsevier. Drake et al: Gray's Anatomy for Students - [www.studentconsult.com](http://www.studentconsult.com)

Anatomy Department



# The nasal cavity



## Lateral Wall

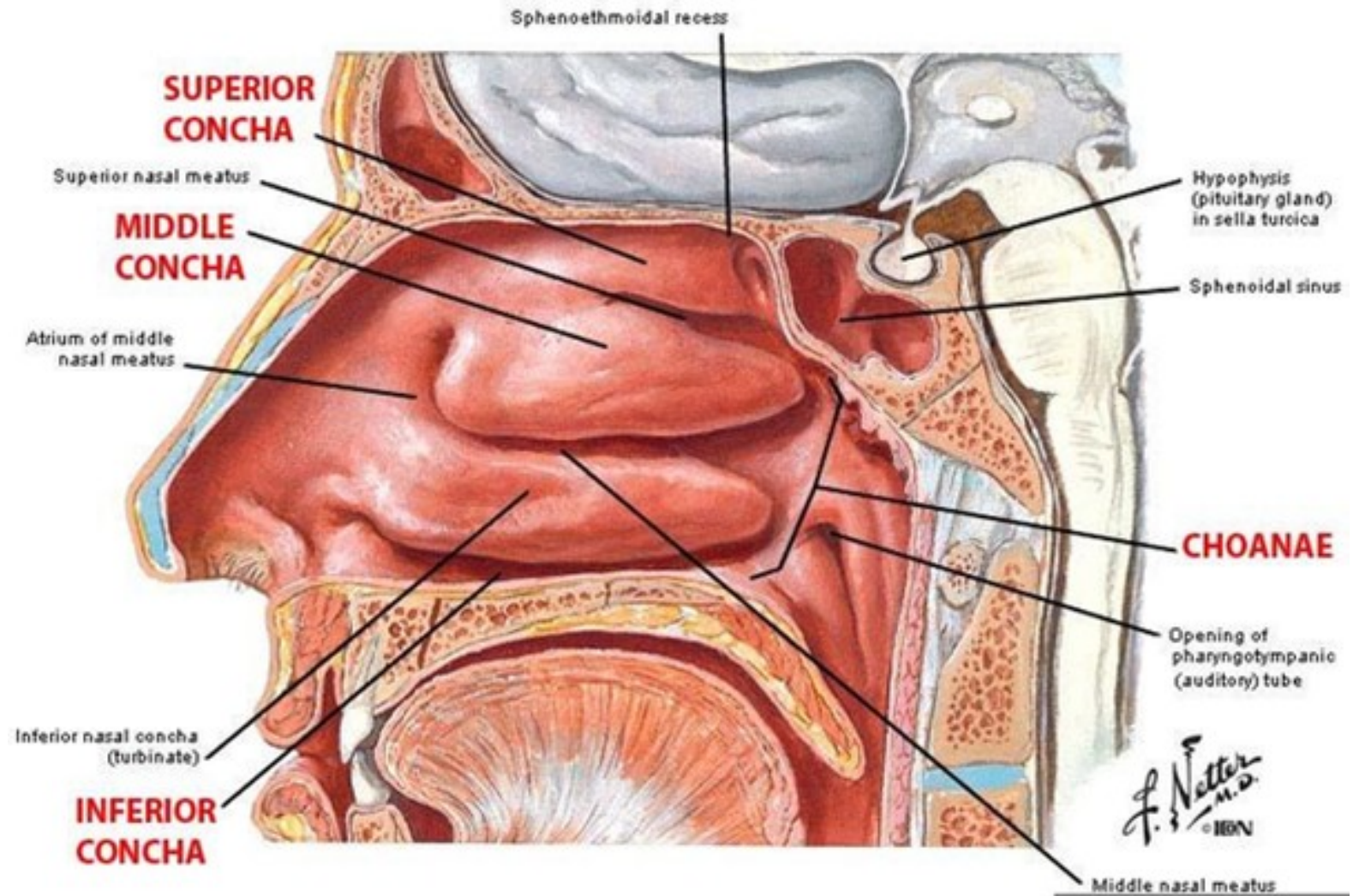
- There are three curved shelves of bone.

### ❑ Conchae

- Superior Conchae
- Middle Conchae
- Inferior Conchae
- There are bony depression under these projections.

### ❑ Meatus

- Superior Meatus
- Middle Meatus



Netter, Basic Science, Atlas of Human Anatomy by Frank H. Netter  
(Paperback, 6th Edition, 2014)

Anatomy Department



# Paranasal Air Sinuses



## 1. Frontal sinus

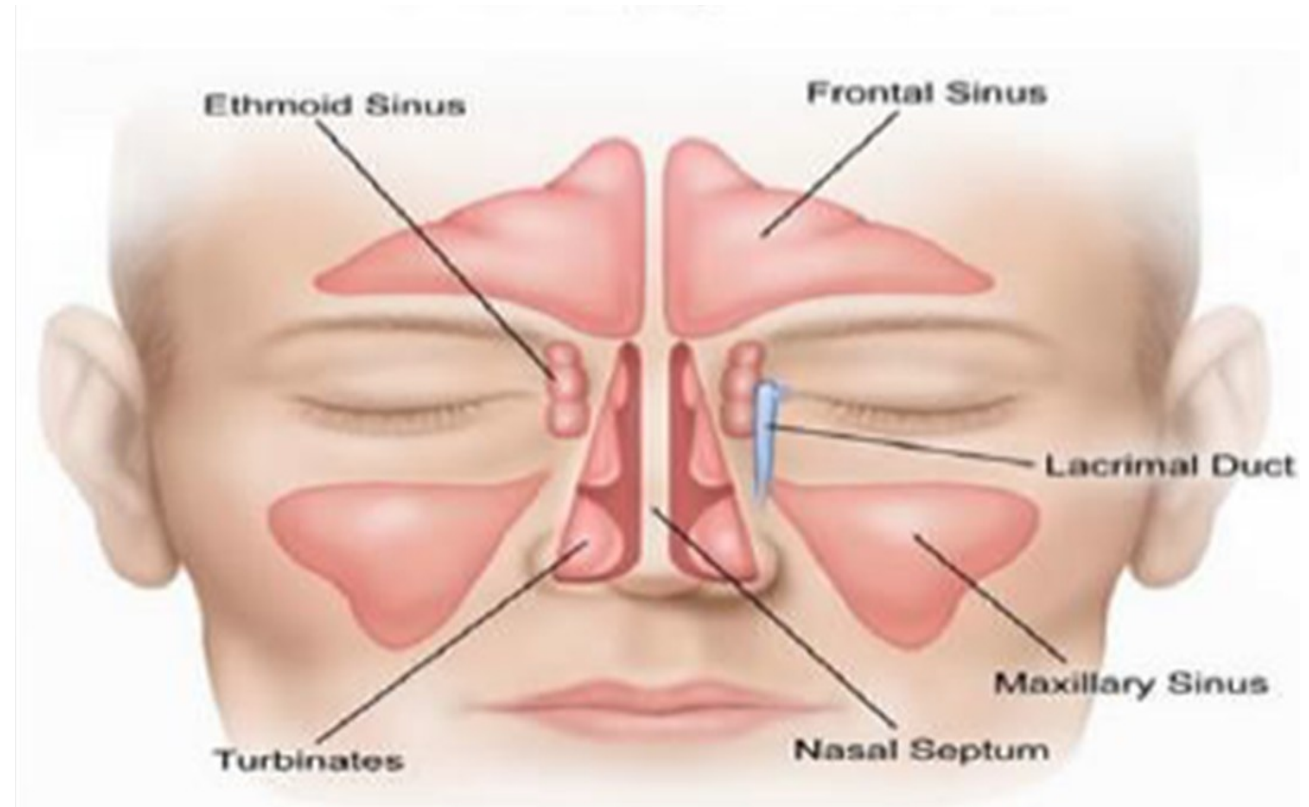
- lies within the inner and outer plates of the frontal bone.

## 2. Sphenoid sinus

- lies within the body of the sphenoid

## 3. Ethmoidal sinus

- lies within the Ethmoid bone.



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRPzYVPk9j1vn1F71W5mSR5auInM4nBFz2gxFyavCfnLbnXf3VxeA>

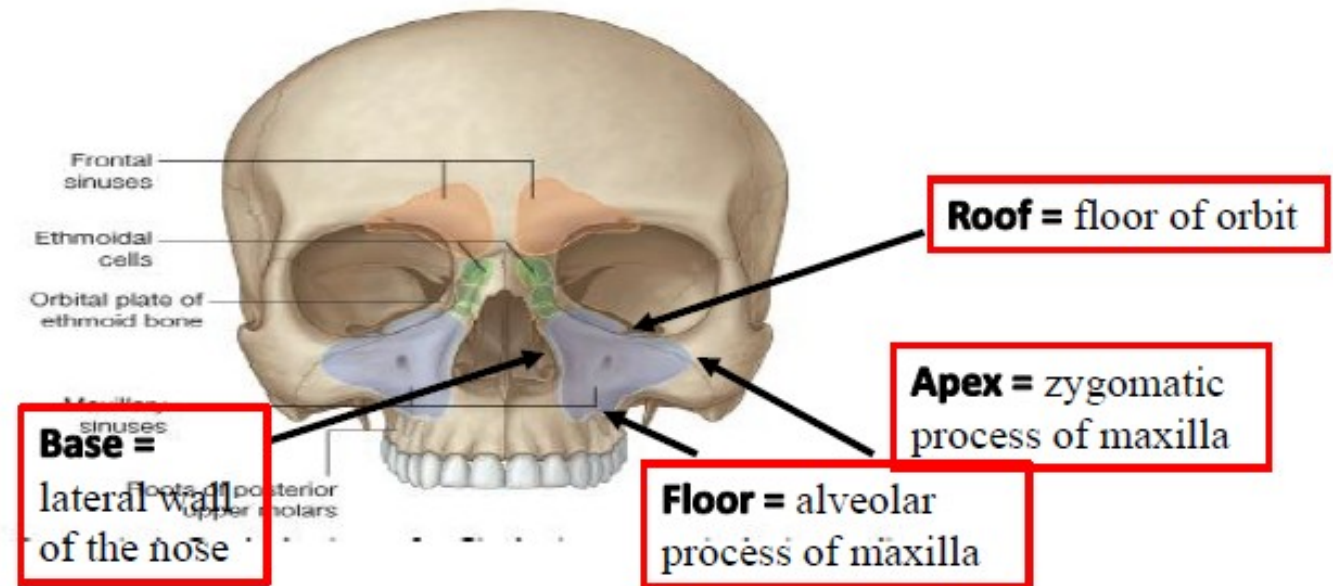
# Paranasal Air Sinuses



## 4. Maxillary sinus

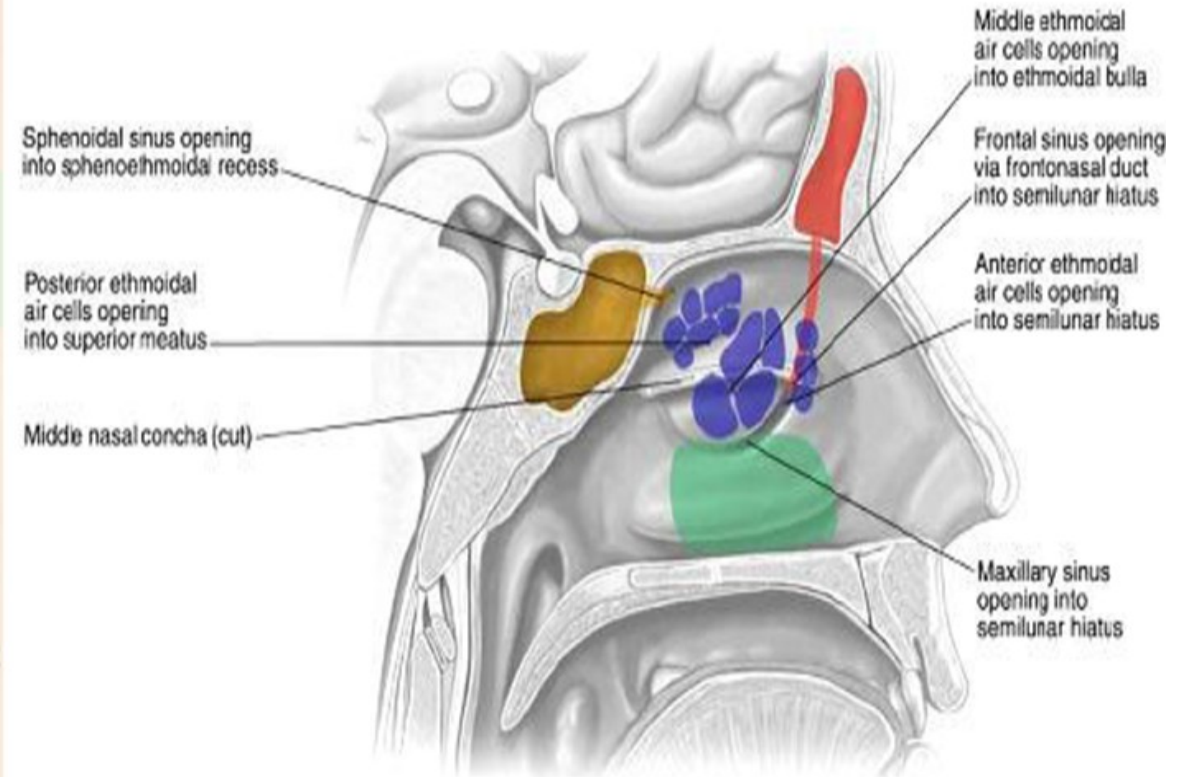
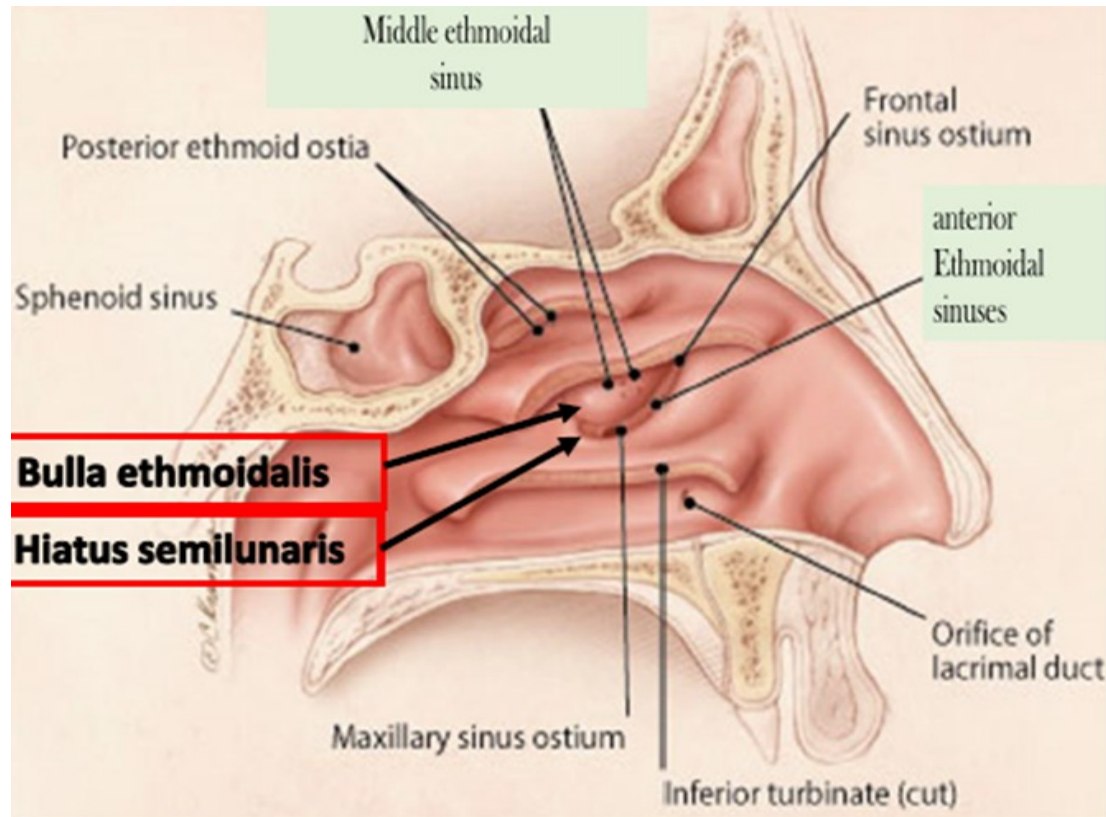
Each is pyramidal in shape

- the **base** is the lateral wall of the nose.
- the **apex** extends to zygomatic process of maxilla.
- The **roof** is the floor of the orbit.
- The **floor** is the alveolar process of maxilla at the roots of the upper molar teeth.



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRPzYVPk9j1vn1F71W5mSR5auInM4nBFz2gxFyavCfnLbnXf3VxeA>

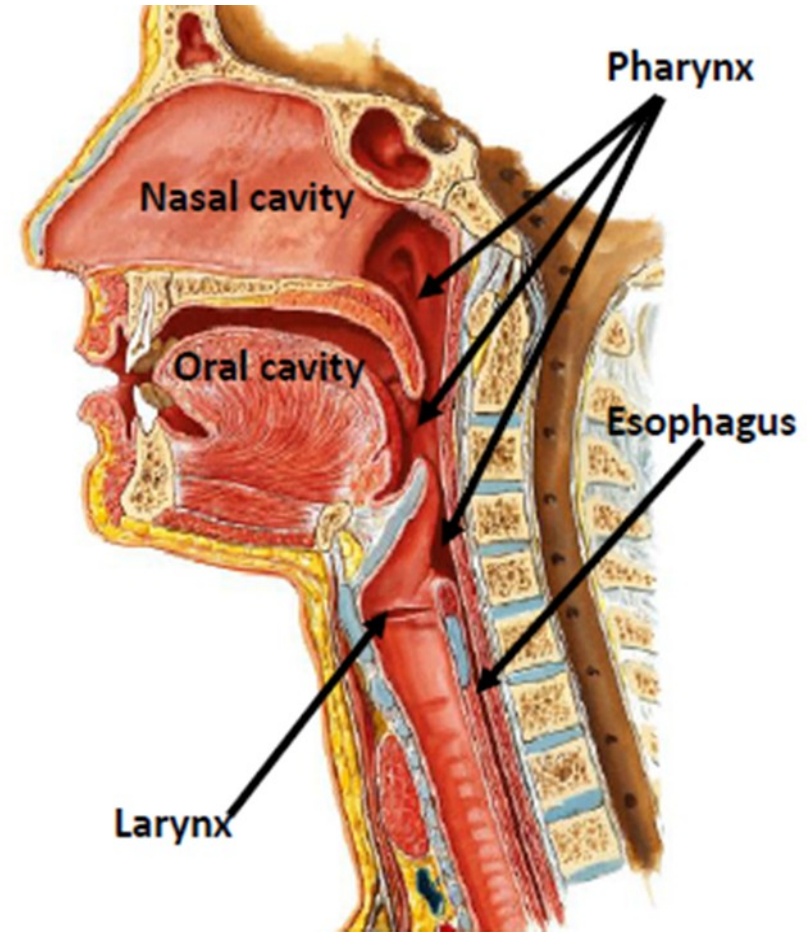
# Site of Drainage of Paranasal Air Sinuses



# Pharynx



- The pharynx is funnel shaped musculofascial tube that links the oral and nasal cavities to the larynx and esophagus.
- Extends from the **base of the skull** to the level of the **sixth cervical vertebra**





# Pharynx

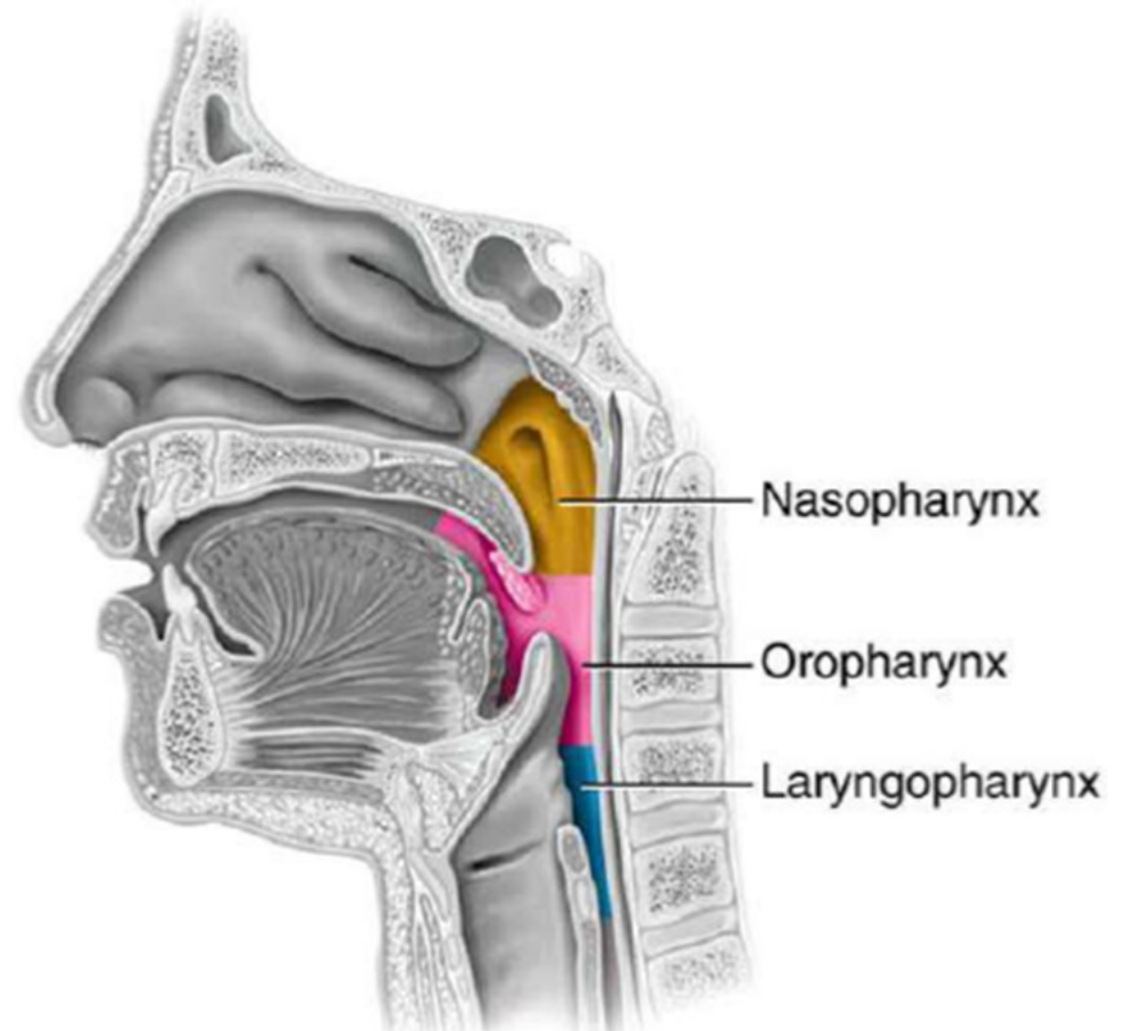


**Pharynx is divided into three sections by location:**

**Nasopharynx:** Posterior to the nasal cavity

**Oropharynx:** posterior to the oral cavity.

**Laryngopharynx:** posterior to the laryngeal inlet





# Nasopharynx

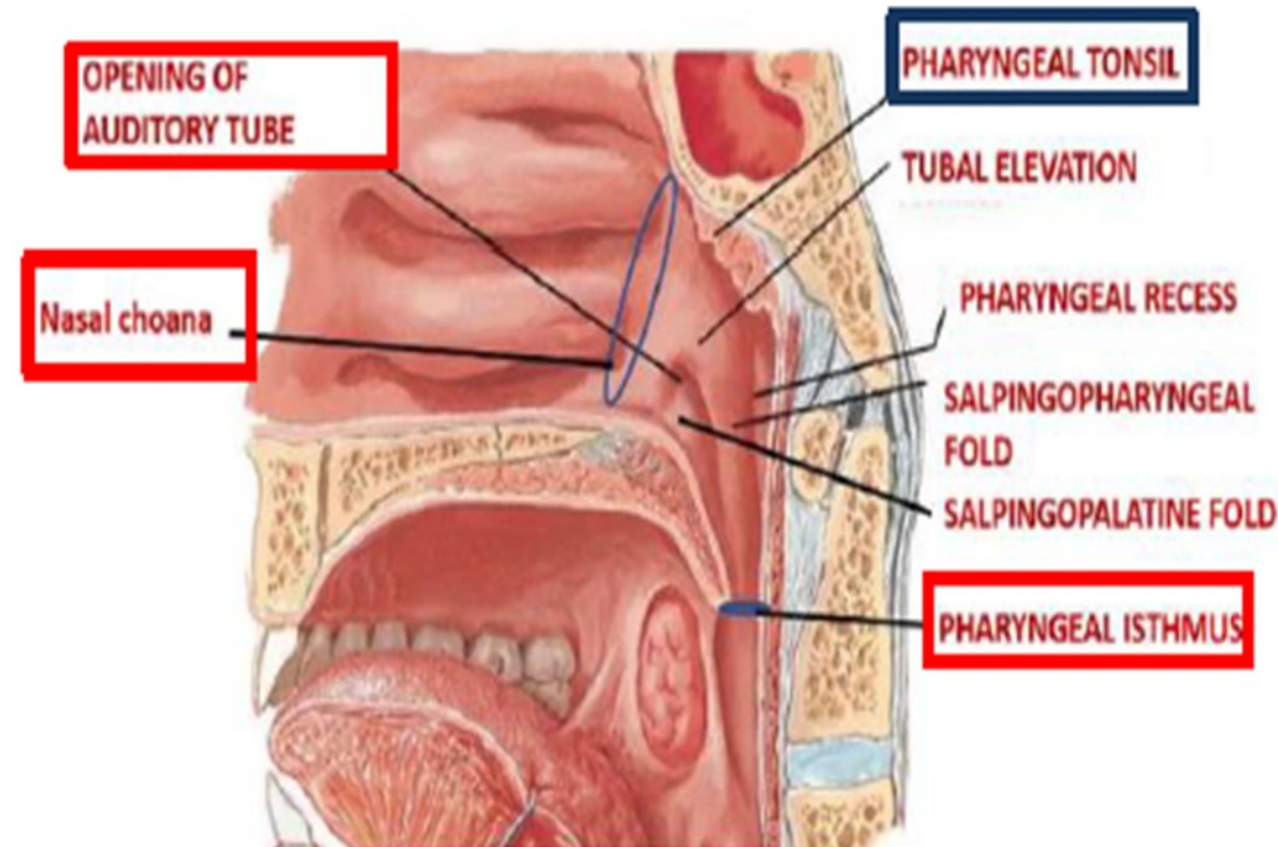


## Location:

Posterior to the nasal cavity  
Superior to the soft palate.

## Communicates with:

- Anteriorly with **nasal cavity** through choanae.
- Inferiorly, it becomes continuous with the **oropharynx** through the pharyngeal isthmus.
- communicates with the **middle ear through** the opening of the auditory tube.
- ❑ The roof contains a collection of lymphoid tissue called the pharyngeal tonsil



# Larynx



□ **The larynx** is located at the point where the respiratory and digestive tracts separate. Extending from the lower border of C3 to the lower border of C6.

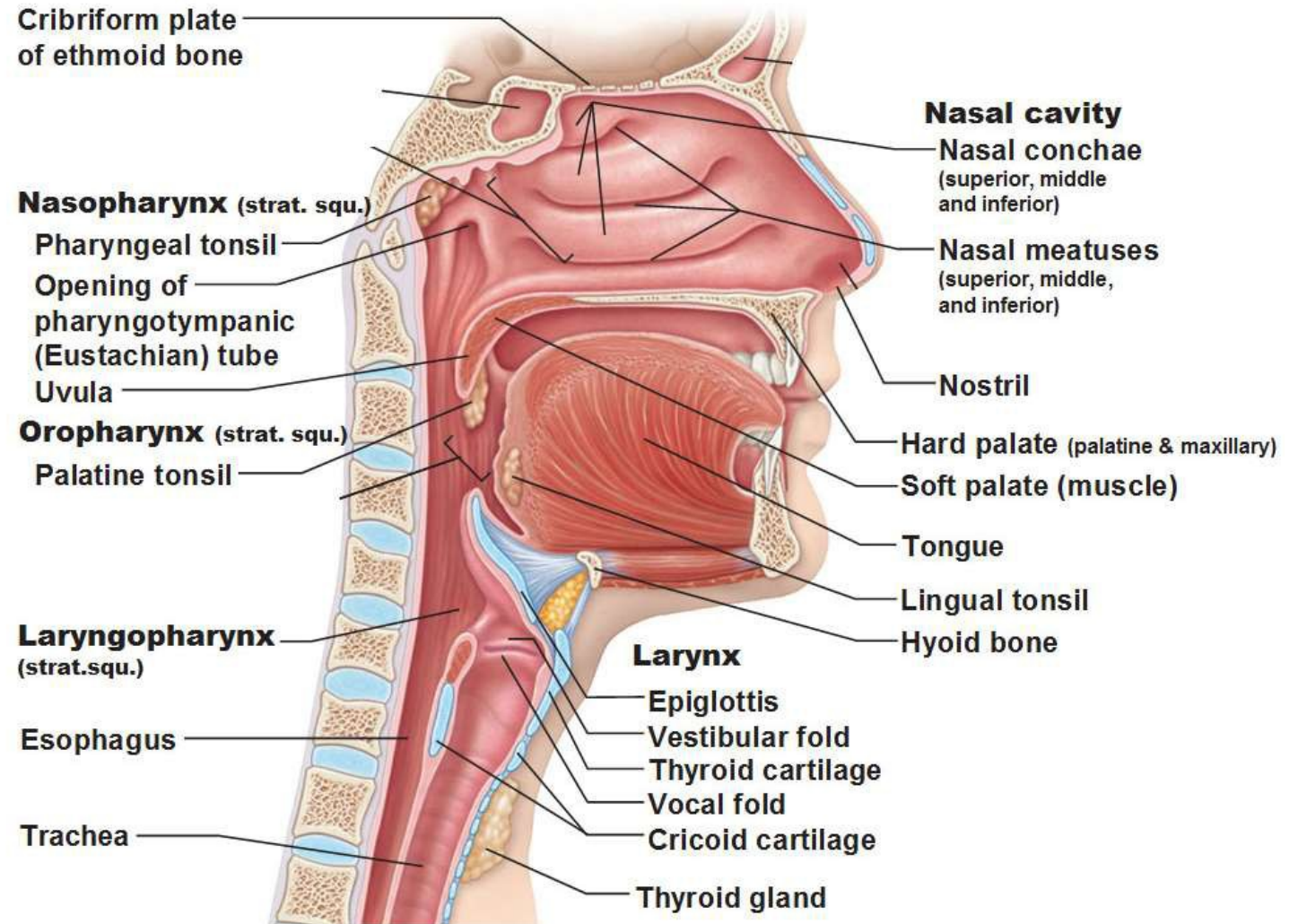
## Relations:

### ➤ Anteriorly:

- Skin
- Superficial fascia
- Deep fascia
- Infrahyoid muscles.

### ➤ Posteriorly:

- Laryngeopharynx



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRPzYVPk9j1vn1F71W5mSR5auInM4nBFz2gxYavCfnLbnXf3VxeA>

# Structure of larynx



Skeleton of 9 cartilages:  
3 singles and 3 pairs.

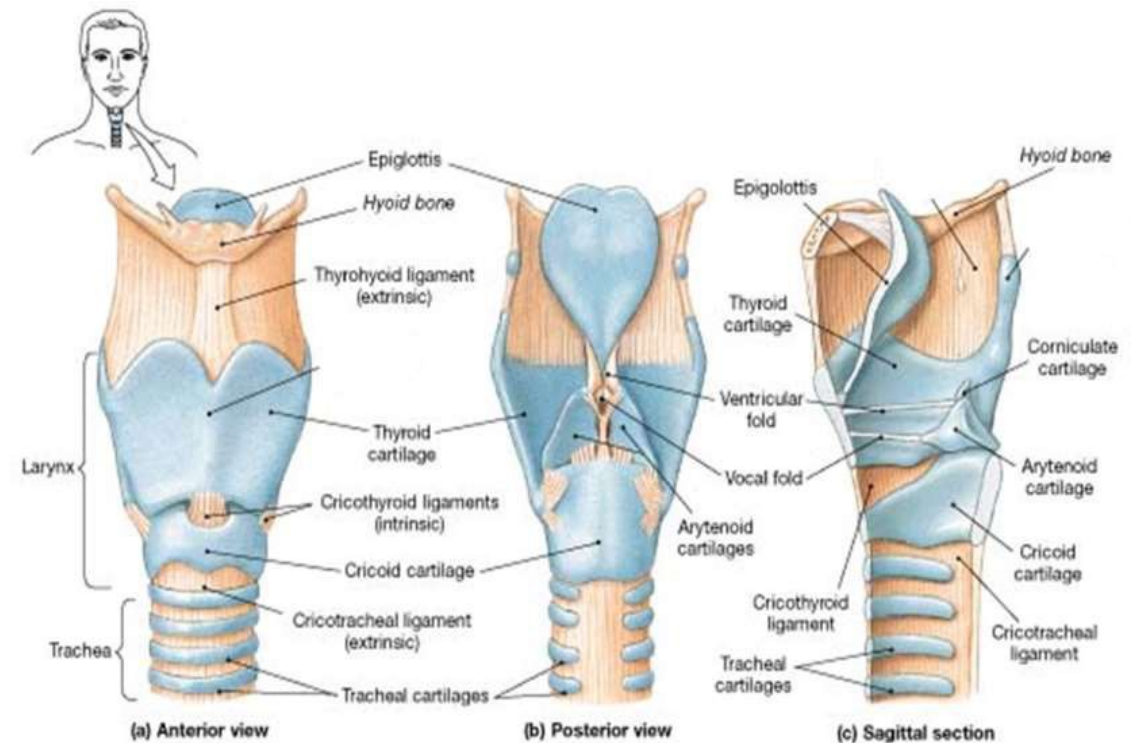
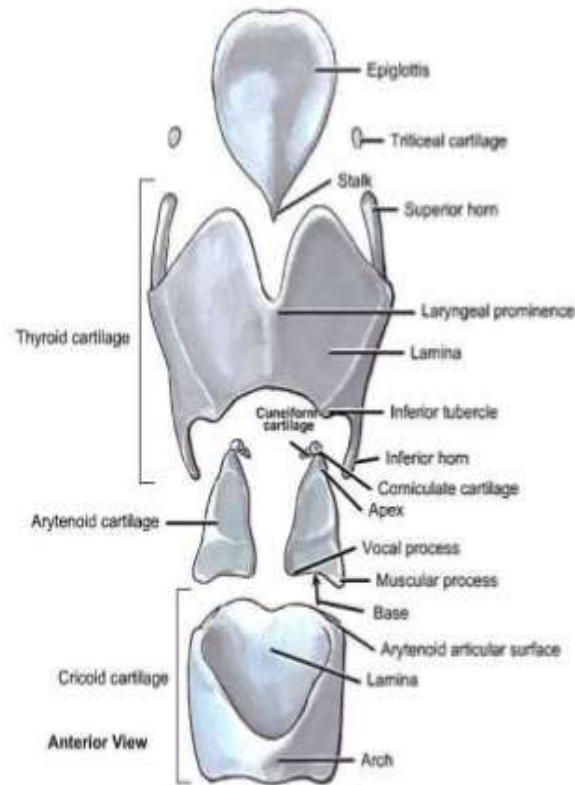
Extrinsic and intrinsic  
membranes and ligaments

## 3 Unpaired

- Thyroid
- Cricoid
- Epiglottis

## 3 Paired

- Arytenoid
- Corniculate
- Cuneiform



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcR3E3GZvS-K9uzs8QZMW1ZjDAETTzQgacwqiOeaEHR7D3kHOVdX>

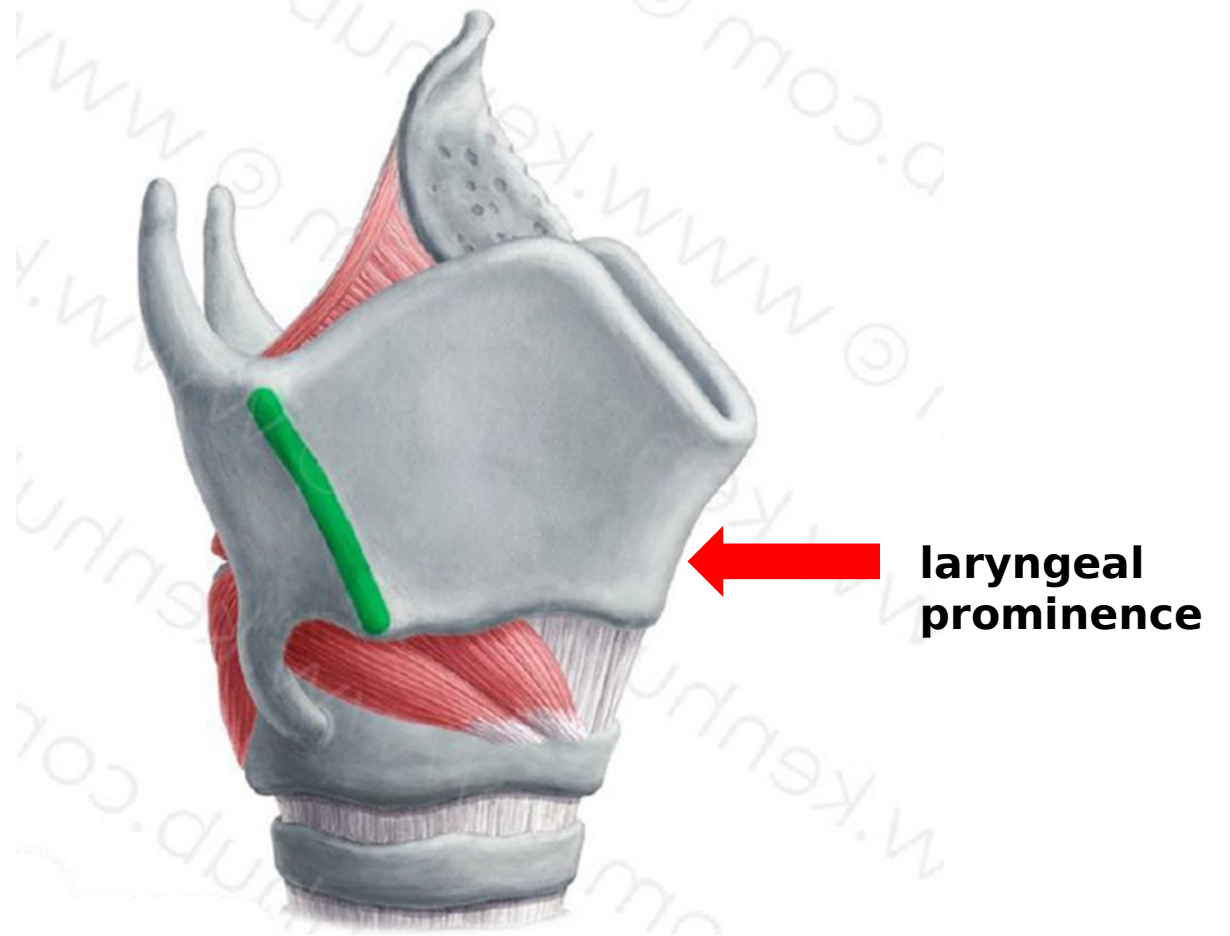


# Structure of larynx



## Thyroid Cartilage

- It is the **largest** of the laryngeal cartilages
- **V-shaped hyaline cartilage** with two laminae **fused** in the **median** plane that forms the **laryngeal prominence** ('Adam's apple').

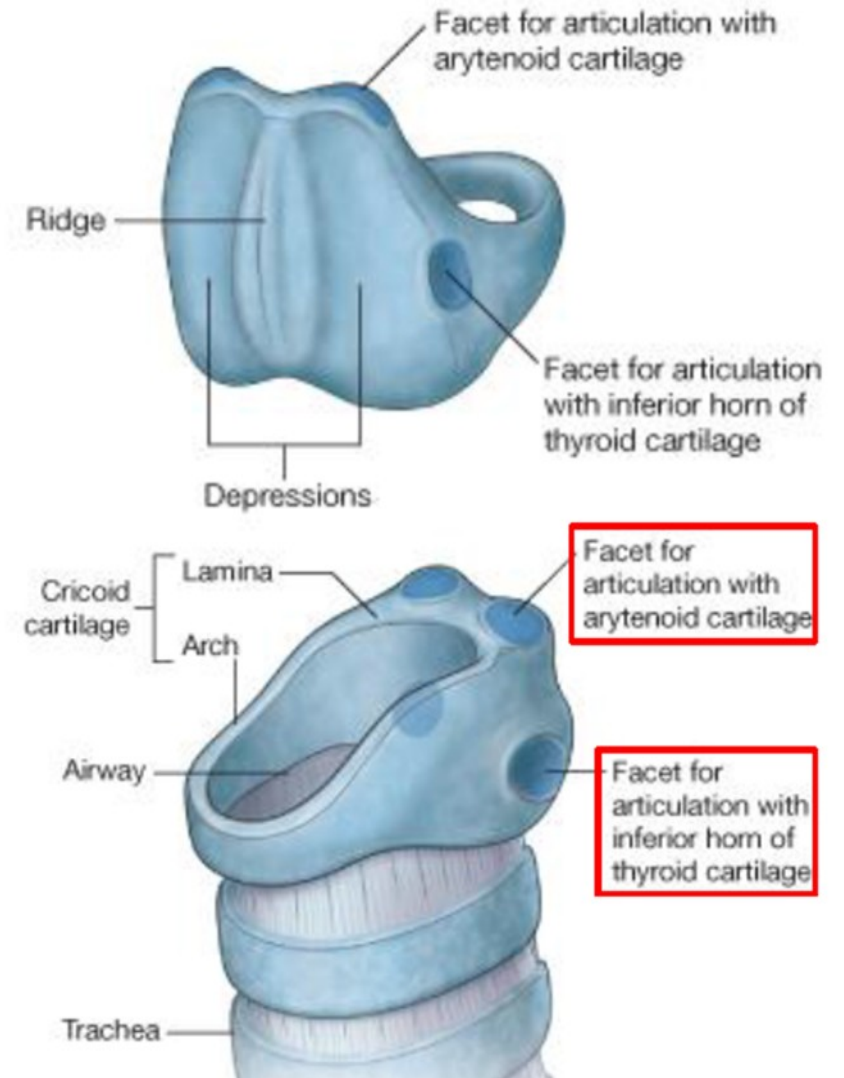


# Structure of larynx



## Cricoid Cartilage

Signet ring shaped hyaline cartilage with a **narrow arch in front** and **broad lamina posteriorly**.



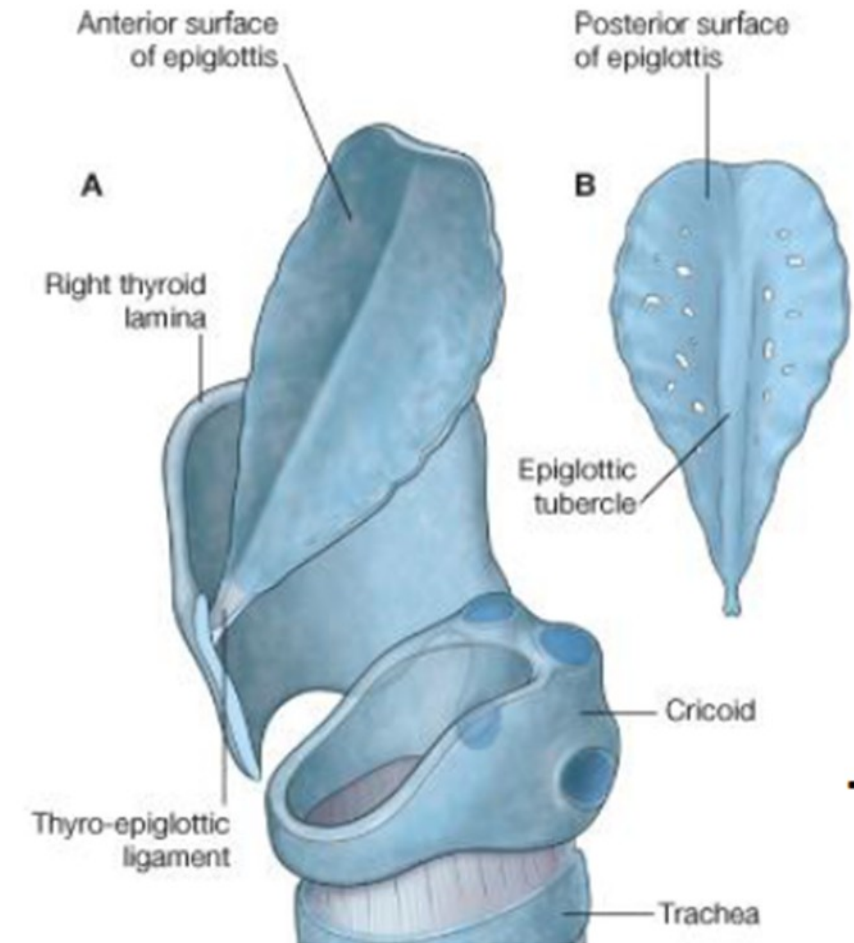


# Structure of larynx



## Epiglottis

- Leaf shaped **elastic** cartilage, attached by its stem to the posterior aspect of the thyroid cartilage by the thyro-epiglottic ligament.
- The upper free end extends up behind the hyoid bone and the base of the tongue.



# Structure of larynx



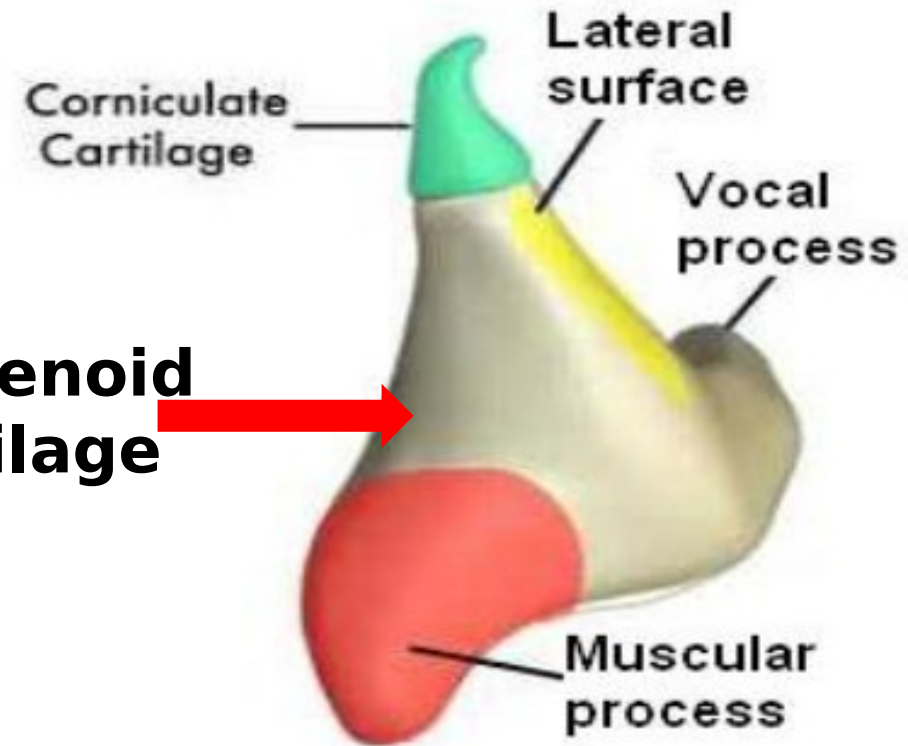
## Paired cartilages

Arytenoid cartilage

Corniculate cartilage

Cuneiform cartilage

Arytenoid  
cartilage



# Structure of larynx

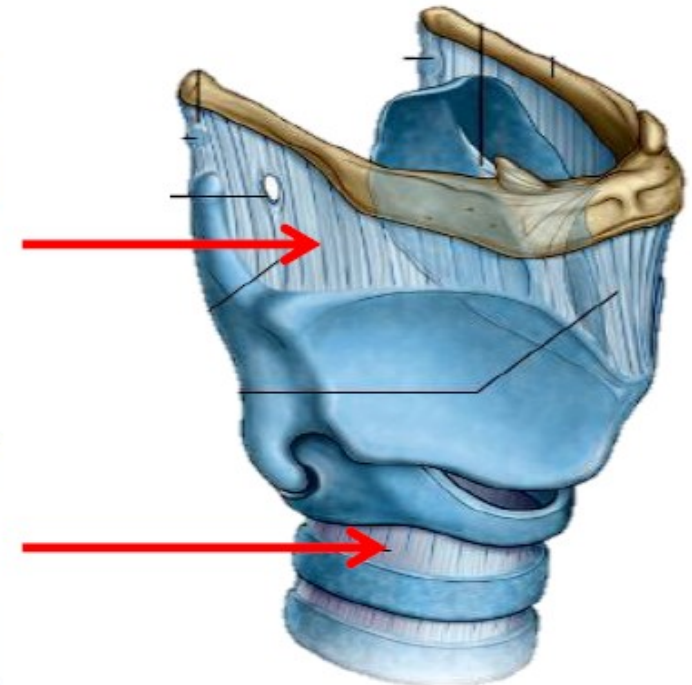


## ❑ Extrinsic Ligaments and Membranes of Larynx

- **Thyro-hyoid membrane**
- **Crico-tracheal ligament**

1- Thyro-hyoid  
membrane

2- Crico-  
tracheal  
ligament



# Structure of larynx



## ❑ Intrinsic ligaments and membranes:

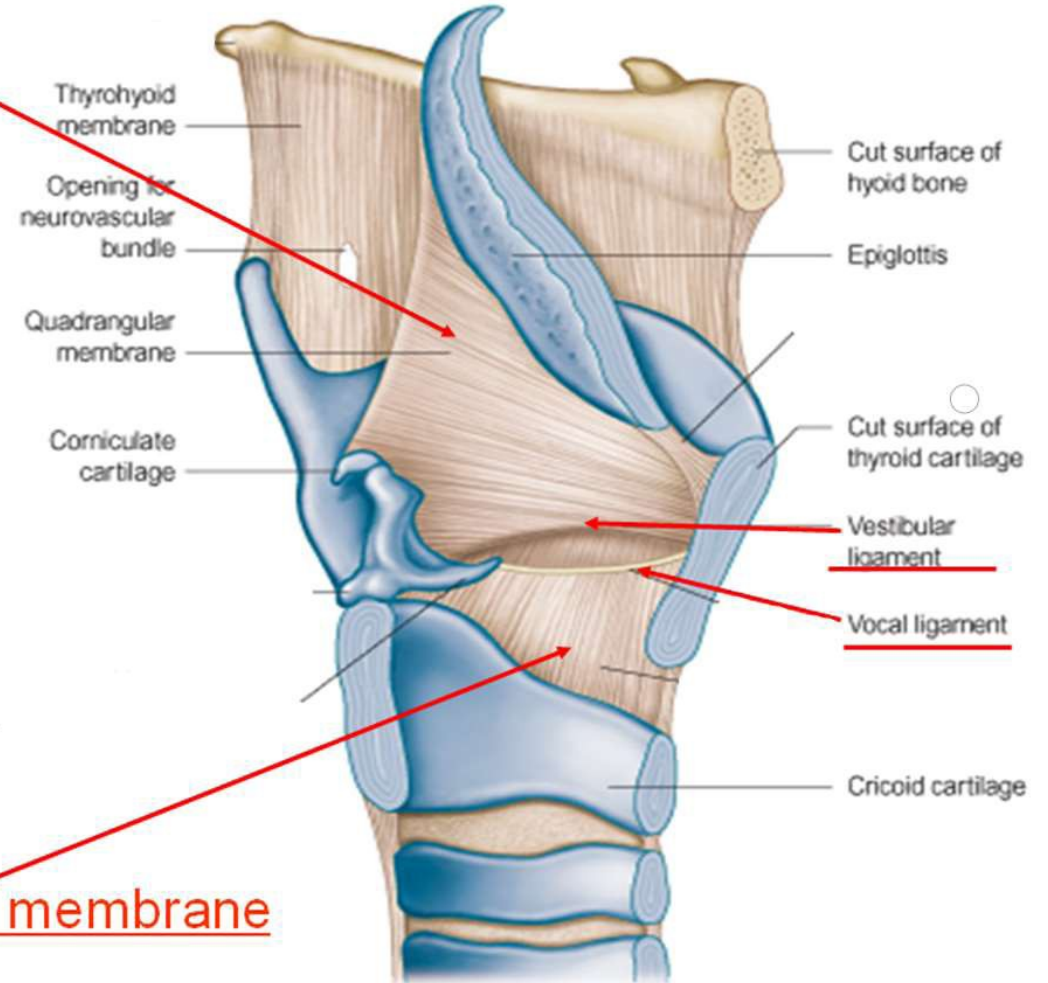
### • Quadrangular membrane

- The upper free margin “aryepiglottic fold” and the lower free margin “**False vocal fold**”.

### • Cricothyroid membrane

- The upper free margin is thickened to form the vocal ligament, which is under **the vocal fold (true 'vocal cord')** of the larynx.

### Quadrangular membrane



### Cricovocal membrane

<https://i.pinimg.com/originals/b6/99/70/b699706cb1d4ed0664f1ced1875f0ac2.png>

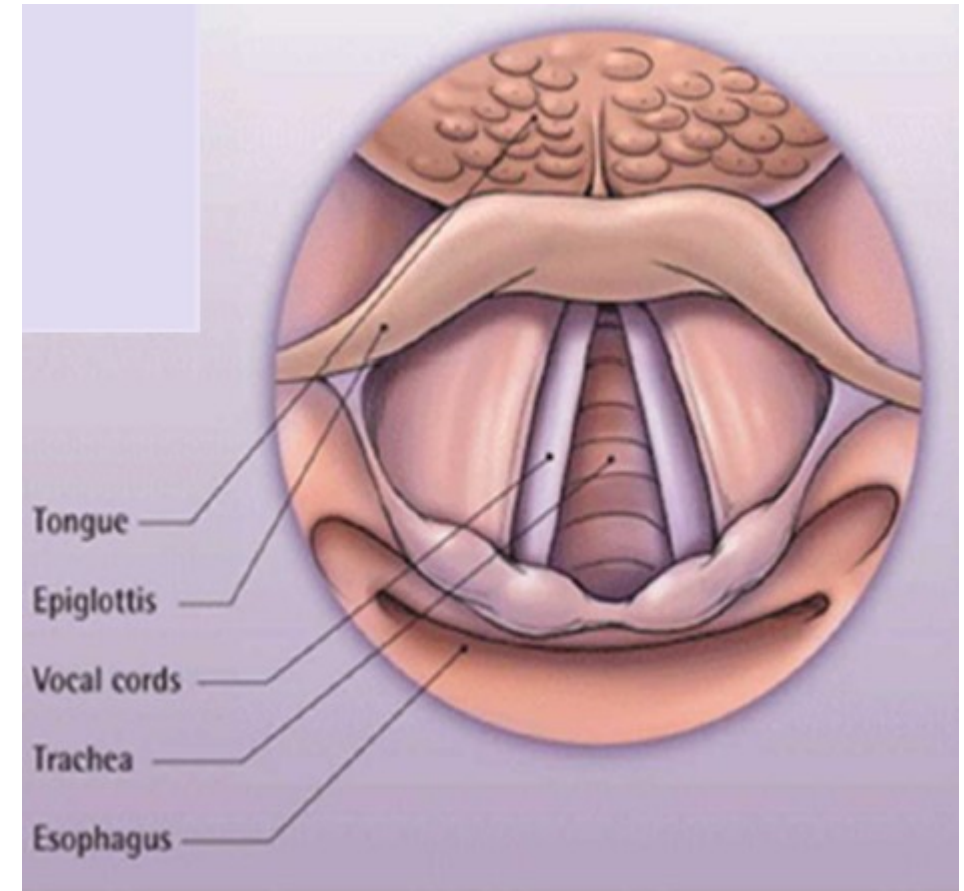
# Structure of larynx



- **Laryngeal inlet**

It is **the superior aperture**

- Below and posterior to the **tongue**
- Anterior to **pharynx**
- **Anterior border → epiglottis**
- **Lateral borders → (aryepiglottic folds)**
- **Posterior border →** Mucosal fold between the two corniculate tubercles

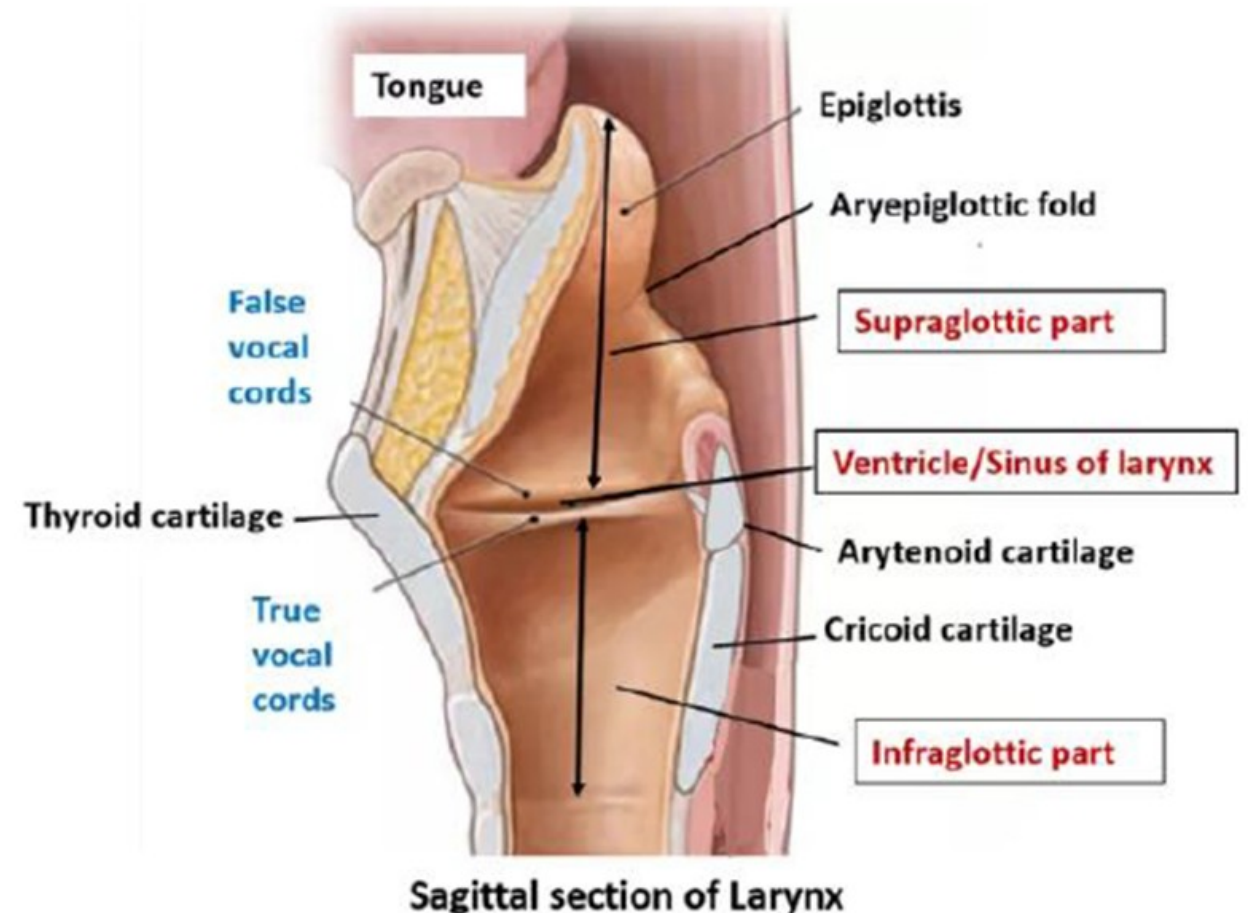




# Structure of larynx



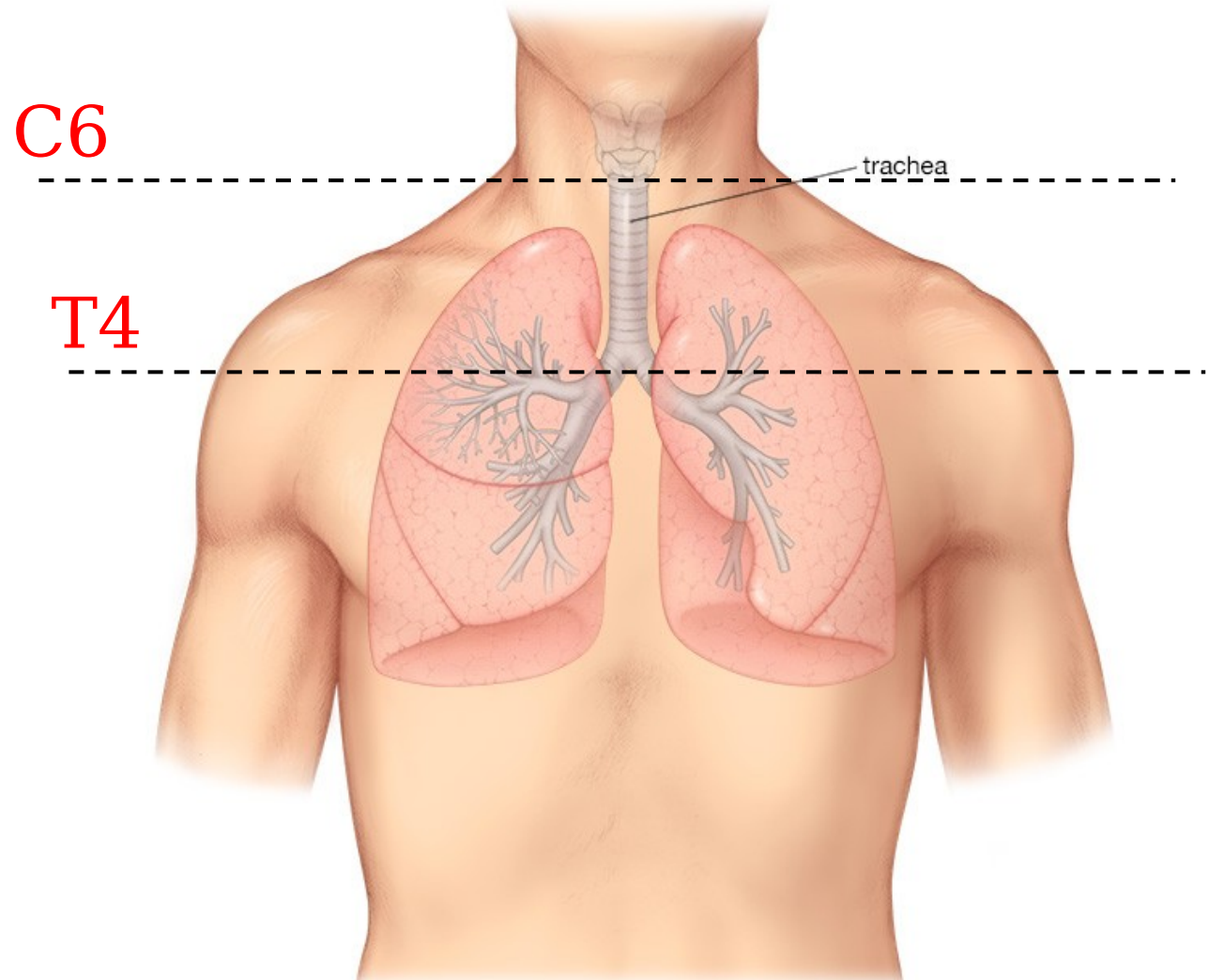
- **Laryngeal Cavity:**  
Extends from laryngeal inlet above to lower border of cricoid cartilage.



# Trachea



It extends from the lower border of **C6** as a continuation of the larynx to the lower border of **T4** to bifurcate at the **carina** into right and left main bronchi.



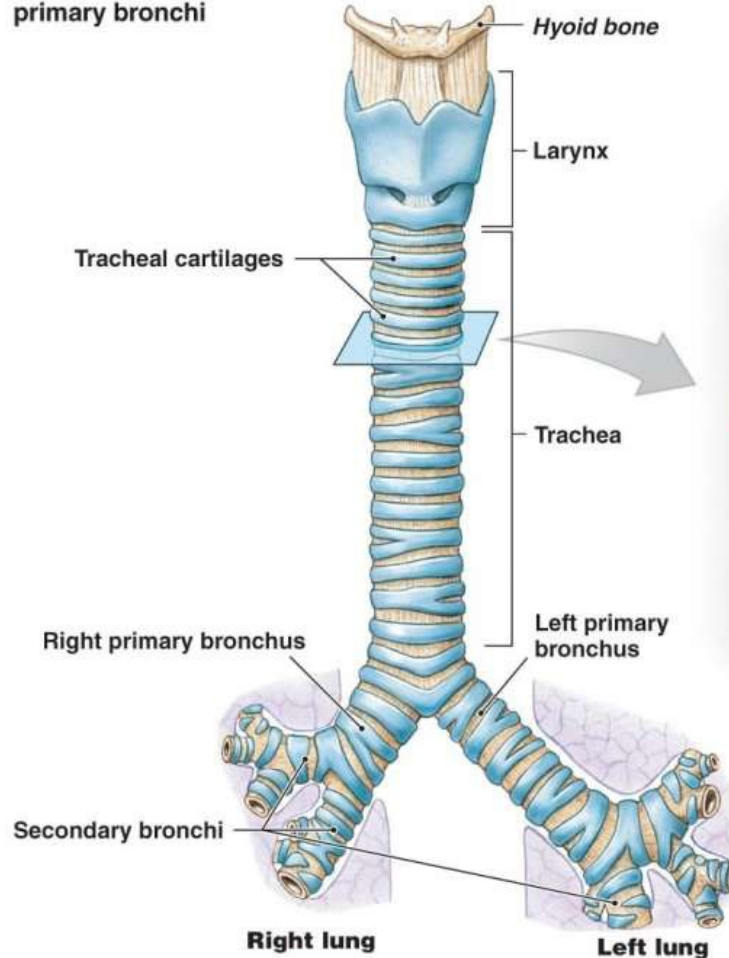
<https://med.stanford.edu/content/dam/sm/ctsurgery/images/clinical-care/thoracic-images/trachea-airway/trachea-and-lungs.jpg>

# Trachea

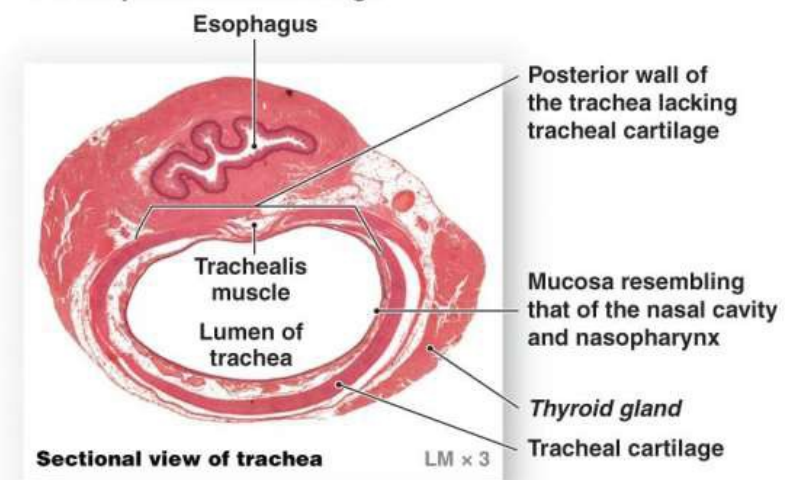


- The trachea is 10 cm long. Consists of 15-20 c-shaped cartilaginous rings.
- The right main bronchus is wider shorter and more in line with the trachea while the left is longer narrower and runs a more horizontal course.

The branching of the trachea within the mediastinum to form the right and left primary bronchi



A sectional view of the trachea showing a C-shaped tracheal cartilage



[https://d2jmvrsizmvf4x.cloudfront.net/LxBusOOQc6ghYDMtnR7g\\_trachea.jpg](https://d2jmvrsizmvf4x.cloudfront.net/LxBusOOQc6ghYDMtnR7g_trachea.jpg)

# Thank you